

## CLAIMS

1. A regeneration controller for regenerating an exhaust purification apparatus that is arranged in an exhaust passage for an internal combustion engine, wherein the exhaust purification apparatus includes an upstream purification portion and a downstream purification portion, the regeneration controller comprising:

a difference detector for detecting at least one of a difference in exhaust pressure, between a first location upstream from the exhaust purification apparatus and a second location downstream from the exhaust purification apparatus, and a difference in exhaust temperature, between a third location upstream from the downstream purification portion of the exhaust purification apparatus and a fourth location downstream from the third location;

a calculation section for calculating an estimated accumulation amount of particulate matter in the exhaust purification apparatus;

a heating control section for heating the exhaust purification apparatus to eliminate the particulate matter from the exhaust purification apparatus when the estimated accumulation amount is greater than a reference accumulation amount; and

a correction control section for correcting the estimated accumulation amount in accordance with the at least one difference, when the estimated accumulation amount falls within a correction determination reference range due to the heating and the at least one difference is greater than a correction reference value.

2. A regeneration controller for regenerating an exhaust purification apparatus that is arranged in an exhaust passage for an internal combustion engine, wherein the

exhaust purification apparatus includes an upstream purification mechanism and a downstream purification mechanism that are arranged in the exhaust passage, the regeneration controller comprising:

a difference detector for detecting at least one of a difference in exhaust pressure and a difference in exhaust temperature between an upstream location and a downstream location of the downstream purification mechanism;

a calculation section for calculating an estimated accumulation amount of particulate matter in the exhaust purification apparatus;

a heating control section for heating the exhaust purification apparatus to eliminate the particulate matter from the exhaust purification apparatus when the estimated accumulation amount is greater than a reference accumulation amount; and

a correction control section for correcting the estimated accumulation amount in accordance with the at least one difference, when the estimated accumulation amount falls within a correction determination reference range due to the heating and the at least one difference is greater than a correction reference value.

3. The regeneration controller according to any one of claims 1 and 2, wherein the correction control section adds to the estimated accumulation amount a correction value that increases as the at least one difference increases.

4. The regeneration controller according to any one of claims 1 to 3, wherein the correction control section determines the correction reference value in accordance with exhaust flow amount.

5. The regeneration controller according to claim 4,

wherein the correction control section decreases the correction reference value as the exhaust flow amount increases.

6. The regeneration controller according to claim any one of claims 4 and 5, further comprising:

a sensor for detecting air intake amount, the correction control section using the detected air intake amount in lieu of the exhaust flow amount.

7. The regeneration controller according to any one of claims 1 and 2, wherein the correction determination reference range includes a value equal to the accumulation amount of particulate matter in the exhaust purification apparatus immediately before the heating is completed.

8. The regeneration controller according to any one of claims 1 and 2, wherein a maximum value of the correction determination reference range is equal to the accumulation amount of particulate matter in the exhaust purification apparatus when the heating is completed.

9. The regeneration controller according to any one of claims 1 to 8, wherein when an estimated accumulation amount obtained by calculation that is resumed, using the corrected estimated accumulation amount, falls within the correction determination reference range again and the at least one difference is greater than the correction reference value, the correction control section repeats the correction of the estimated accumulation amount.

10. The regeneration controller according to claim 9, wherein when a state in which the at least one difference is greater than the correction reference value continues and the

number of times the estimated accumulation amount is corrected reaches a stop determination number, the correction control section refrains from executing the correction of the estimated accumulation amount until the presently performed heating is completed.

11. The regeneration controller according to any one of claims 1 to 10, wherein the regeneration controller is provided with a sulfur elimination mode for restoring the exhaust purification apparatus from sulfur poisoning by releasing sulfur components from the exhaust purification apparatus, and the correction control section refrains from correcting the estimated accumulation amount when the regeneration controller is in the sulfur elimination mode or when the sulfur elimination mode is requested.

12. The regeneration controller according to any one of claims 1 to 11, wherein the exhaust purification apparatus is a catalytic converter including a base coated with a layer of NO<sub>x</sub> storage reduction catalyst, the base being formed to filter particulate matter contained in exhaust.

13. The regeneration controller according to any one of claims 1 to 11, wherein the exhaust purification apparatus includes:

- a NO<sub>x</sub> storage reduction catalyst device; and
- a filter, arranged downstream from the NO<sub>x</sub> storage reduction catalyst device and having a layer of a NO<sub>x</sub> storage reduction catalyst, for filtering particulate matter contained in exhaust.

14. An electronic control unit serving as the calculation section, the heating control section, and the replacement control section according to claim 1 or 2.